

What is claimed is:

1. A precursor polypeptide of phytosulfokine derived from *Arabidopsis thaliana*, said precursor polypeptide being following (a) or (b) :
 - (a) a polypeptide consisting of an amino acid sequence defined as amino acid numbers from 1 to 87 in SEQ ID NO: 1 in the sequence list,
 - (b) a polypeptide consisting of an amino acid sequence having more than 70% of sequence homology with said polypeptide (a), said polypeptide (b) being processed and sulfated on the tyrosine residue of said phytosulfokine in a plant cell to secrete said phytosulfokine with its tyrosine residue sulfated, thereby capable of promoting proliferation of said plant cell.
2. A gene encoding said precursor polypeptide of phytosulfokine according to claim 1.
3. A gene encoding said precursor polypeptide of phytosulfokine according to claim 1, said gene consisting of a base sequence defined as base numbers from 40 to 303 in SEQ ID NO: 2 in the sequence list.
4. A gene encoding a precursor polypeptide of phytosulfokine derived from *Arabidopsis thaliana*, said gene being following (c) , (d) or (e):
 - (c) a gene consisting of a base sequence defined as base numbers from 1 to 545 in SEQ ID NO: 2 in the sequence list,
 - (d) a gene consisting of a base sequence that hybridizes with the base sequence (c) under a stringent condition,
 - (e) a gene consisting of a base sequence having more than 70% of sequence homology with said gene (c), said gene (e) encoding a polypeptide being processed and sulfated on the tyrosine residue of said phytosulfokine in a plant cell to secrete said phytosulfokine with its tyrosine residue sulfated, thereby capable of promoting proliferation of said plant cell.
5. A method to promote proliferation of a plant cell, the method comprising incorporation of said gene according to either one of claim 2 to claim 4 into said plant cell.
6. A transgenic plant cell comprising said gene according to either one of claim 2 to claim 4 incorporated therein to promote proliferation of said plant cell.
7. A precursor polypeptide of phytosulfokine derived from *Arabidopsis*

thaliana, said precursor polypeptide being following (f) or (g) :

(f) a polypeptide consisting of an amino acid sequence defined as amino acid numbers from 1 to 79 in SEQ ID NO: 3 in the sequence list,

(g) a polypeptide consisting of an amino acid sequence having more than 70% of sequence homology with said polypeptide (f), said polypeptide (g) being processed and sulfated on the tyrosine residue of said phytosulfokine in a plant cell to secrete said phytosulfokine with its tyrosine residue sulfated, thereby capable of promoting proliferation of said plant cell.

8. A gene encoding said precursor polypeptide of phytosulfokine according to claim 7.

9. A gene encoding said precursor polypeptide of phytosulfokine according to claim 7, said gene consisting of a base sequence defined as base numbers from 43 to 282 in SEQ ID NO: 4 in the sequence list.

10. A gene encoding a precursor polypeptide of phytosulfokine derived from *Arabidopsis thaliana*, said gene being following (h) , (i) or (j):

(h) a gene consisting of a base sequence defined as base numbers from 1 to 479 in SEQ ID NO: 4 in the sequence list,

(i) a gene consisting of a base sequence that hybridizes with the base sequence (h) under a stringent condition,

(j) a gene consisting of a base sequence having more than 70% of sequence homology with said gene (h), said gene (j) encoding a polypeptide being processed and sulfated on the tyrosine residue of said phytosulfokine in a plant cell to secrete said phytosulfokine with its tyrosine residue sulfated, thereby capable of promoting proliferation of said plant cell.

11. A method to promote proliferation of a plant cell, the method comprising incorporation of said gene according to either one of claim 8 to claim 10 into said plant cell.

12. A transgenic plant cell comprising said gene according to either one of claim 8 to claim 10 incorporated therein to promote proliferation of said plant cell.